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EUROMARKETS AND MONETARY CONTROL: THE DEUTSCHEMARK CASE *)

by

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Eurocurrency markets have grown considerably in the last 20 years. This growth has stimulated awareness of the money and credit creating potential of these markets. As a consequence, the necessity and possible implementation of administrative controls of Euromarkets have been discussed, in the literature as well as among monetary authorities [1]. The debate is going on; conclusions reached so far differ substantially on basic issues [2].

In the following paper, I focus on the monetary expansion potential of the Euro-DM market in relation to money stock control in Germany. To establish the necessary institutional knowledge for the attempted (partial) analysis, I first describe (part I) some relevant characteristics of the Euro-DM market as well as some basic features of monetary control in Germany. In part II the money and credit creating potential of the Euro-DM market is discussed in relation to monetary control in Germany. The analysis contains a critical "institutional" view of multiplier analysis and interest rate determination in the Euro-DM market. The main findings are summarized in some concluding remarks.

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1) See, for example, Wallich (1979), Tobin (1980), Usher (1980), Mayer (1981), Cooke (1981), Frydl (1982).

2) For example on the so-called multiplier issue. For a recent juxtaposition, see de Cecco (1982) and Folkerts-Landau (1982).

PART I - INSTITUTIONAL BACKGROUND

1. Institutional Characteristics of the Euro-DM market [1)]

. Definition

The Euro-DM market is, in principle, the market for Deutsche Mark bank loans and deposits outside Germany. To get a statistically operational "working definition", the term "outside Germany" will be confined to the geographical coverage of available BIS statistics, that is, to the 13 countries reporting to the BIS (Bank for International Settlements) in Basle; these are the EEC countries except Greece (and except Germany, of course) plus Austria, Sweden and Switzerland, Canada and Japan. In addition, the definition will be restricted to DM assets and liabilities of foreigners outside the Eurobank's country of residence; this means that, from the Eurobank's point of view, all Euro-DM transactions are necessarily border-crossing ones. In summary, the Euro-DM market is defined as the market for Deutsche Mark loans and deposits vis-à-vis non-residents in 13 countries outside Germany.

. Market Centers

The center of the market is clearly located in Europe; the word "Euro" seems to be, therefore, quite correct. Luxembourg is the most important market place for Euro-DM transactions, owing to the presence of about 30 subsidiaries of German banks (end 1981). In practice, these German Euro-banks constitute the total of the Luxembourg Euro-DM center. Compared with the total market volume of DM 270 billion gross liabilities (end 1981), the Luxembourg share amounts to approximately DM 150 billion.

Another important center of the Euro-DM market is London, where about a dozen German banks are represented by foreign branches. These branches are legally part of the German parent bank; therefore, they are (unlike subsidiaries) subject to German bank supervision. Taken together, Luxembourg and London account for about 2/3 of the market volume. The remainder of Euro-DM deposits is mostly held with banks in France, Belgium, the Netherlands and Switzerland.

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1) This section is based on a recent survey article by the Deutsche Bundesbank (1983) and on two recent papers by Storck (April 1983) and Steffens (May 1983) given at the Institut für Kapitalmarktforschung an der Johann Wolfgang Goethe Universität, Frankfurt.

The geographical proximity to West Germany is only one important reason for the actual location of the two Euro-DM market centers. In addition, there are two major locational advantages in economic terms:

- In Luxembourg as well as in London, there are no minimum reserve requirements on Euro-bank deposits;

- Capital flows between Germany and these two market places are fully liberalized.

As a result, Euro-banks in Luxembourg and London are in a particularly favourable competitive position; they are able to work, for example, on a rather small spread between deposit and lending rates (which amounts, as a rule, to 1/2 percentage point only).

In rather small amounts, Deutsche Mark transactions are also conducted by banks in the so-called offshore centers outside Europe - for instance in the Carribean (where German banks are represented by branches) or in Singapore and Hong Kong. Since December 1981 Euro-DM deposits may also be held with IBF's (International Banking Facilities) in the United States.

. Volume and Growth

According to BIS statistics, the Deutsche Mark bank deposits held by commercial banks, monetary authorities and non-banks in 13 reporting countries outside Germany amounted to DM 270 billion in mid-1982. The corresponding figure of DM 287 billion on the asset side of Euro-bank balance sheets diverged only slightly from this liability position. Relative to all Eurocurrency markets in the European reporting area, Canada and Japan (13 countries, see above), the Euro-DM market accounts for roughly 11 % of the total.

Just like other Euro-currency markets, the Euro-DM market has expanded much faster than comparable domestic markets. Total outstanding Deutsche Mark liabilities vis-à-vis non-residents of the European reporting banks were, in June 1982, about five times as large as ten years earlier; Euro-DM holdings in that decade thus grew on average by about 19 % per year (while the business volume of domestic German banks increased only half as much).

The Euro-DM market did not expand continuously, however; growth rates fluctuated sharply in reaction to external influences. For example, the pace of expansion accelerated sharply in response to the dollar crisis in 1977/78 and the second oil price explosion in 1979. In 1980/81 changed forms of recycling OPEC surpluses (like direct official borrowing in OPEC countries) and a sharp decline in OPEC's current account surplus caused much lower growth rates in Eurocurrency markets. This slack was particularly felt in the DM part of the markets, as a delining DM exchange rate trend (against the US dollar) and relatively low German interest rates rendered the Deutsche Mark less attractive than the US dollar. This situation has continued until recently.

. Deposit and Lending Characteristics[1)]

In DM deposit and lending business, the principle of currency-matched funding applies, i.e. Deutsche Mark assets are basically funded by Deutsche Mark liabilities, so that the Euro-banks do not incur an exchange rate risk. There is another "matching" between DM assets of Euro-banks and their DM liabilities: Both total amounts are usually largely in balance[2)].

Just like in the Euro-Dollar market, the deposits in the Euro-DM market are of a short-term nature, ranging from daily call money to funds for one, three or twelve months; maturities up to three months seem to dominate.

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1) As regards interest rates, see pp. 18 below.

2) For details and comments, see Deutsche Bundesbank (1983), p. 30/31.

Deposits are generally traded only in large, standardized amounts, from a minimum of roughly DM 500.000 onwards[1]. This feature of the market is sometimes called its "wholesale" character[2].

Unlike in the Euro-dollar market, there are no negotiable certificates of deposit in the Deutsche Mark sector of the Euro-market, so that deposits cannot be transferred to other market participants before maturity.

Lending is tailored to deposit business, i.e. to the large share of very short-term deposits: Euro-banks perform maturity transformation by taking short-term deposits and extending long-term loans. Technically, long-term lending to non-banks is typically given in the form of roll-over credits: The nominal interest rate on such loans is fixed for a short period of 3 or 6 months only, and then repeatedly "rolled over", and adjusted, to the current cost of refinancing.

This technique assures that interest rates on loans closely follow the short-term borrowing cost of Euro-banks, i.e. their offered deposit rates; and it leads to a clear-cut distribution of risk-taking: The risk of interest rate changes rests fully with the borrower; the risk of maturity transformation (i.e. of securing a follow-up financing) rests fully with the bank.

. Market Participants

Market participants are mainly the Euro-banks themselves. They conduct sizable interbank transactions in order to exploit interest rate differentials and to adjust their liquidity position. The share of these transactions between Euro-banks is substantial: about two thirds of the total market volume (roughly DM 200 billion out of total liabilities of DM 270 billion) is likely to be accounted for by interbank transactions.

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1) Storck (1980), p. 450.

2) Deutsche Bundesbank (1983), p. 30; Goodhart (1982), p. 4.

Foreign central banks are major depositors in the market, too. Usually, their motivation is distribution of exchange rate risk, to be accomplished by currency diversification of their monetary reserves. Their deposits in Euro-DM amounted to DM 40 billion in June 1982.

Non-banks from Germany and abroad are depositing considerable amounts in the Euro-DM market, too (a total of DM 28 billion). However, German and foreign non-banks are much more important as borrowers in the Euro-DM market. In June 1982, German non-banks alone were indebted to the Euro-DM market to an amount of DM 73 billion; together with foreign non-banks (DM 27 billion), outstanding Euro-DM loans to non-banks thus totalled DM 100 billion.

Most interesting, in the present context, is the rôle of domestic German banks. In general, if there are no barriers to international capital flows, the Euromarket is, in the respective national currency, to be seen as an extension of the domestic money market - and not as an independent banking system of its own. As there are no restrictions on capital transactions in Germany, the German banks may place, for example, excess liquidity in the Euro-DM market at any time. Euro-DM borrowings by German banks are likewise unrestricted.

Several points of clarification and explanation are needed here:

. The Rôle of Domestic German Banks

The net DM position of German banks with Euro-banks has fluctuated markedly over time. In June 1982 the outstanding DM assets of Euro-banks vis-à-vis German banks amounted to DM 42 billion, which was about 15 % of total assets of the Euro-DM market (in the narrow working definition given above). At the same time, Euro-banks held DM liabilities against German banks in the amount of DM 30 billion. On balance, therefore, there was a net creditor position of Euro-banks vis-à-vis German banks of DM 12 billion. Four years ago, in mid-1978, this net indebtedness of German banks in the Euro-DM market stood at DM 5 billion. There has always been, to a varying degree, a net creditor position of Euro-banks in Deutsche Mark against German banks.

As the Euro-DM market is not independent of the German money market, its rôle as a channel for short-term capital flows is closely linked to the activities of domestic German banks, too. This is illustrated by the balancing function of German banks in the Euro-DM market. If there are large (say, speculative) short-term inflows into the Euro-DM market, there will be an increasing surplus of funds in the market (deposits are much more flexible than loans). Euro-banks respond by running down their short-term DM-liabilities to German banks, i.e. increasing their net creditor position against German banks. After the period of speculation (for instance, when the expected DM exchange rate change has taken place), there will be a decline in DM-deposits of foreigners at Euro-banks. Correspondingly, Euro-banks are forced to borrow from domestic German banks, thus decreasing their net creditor position against German banks[1]. Experience corroborates this. In June 1981, before the EMS-realignment of October 1981, net indebtedness of German banks vis-à-vis banks in the Euro-DM market amounted to DM 15 billion; after the realignment, in December 1981, this figure had fallen to DM 6 billion.

Finally, it should be noted that the involvement of German banks in the Euro-DM market rests on a particular institutional detail: In principle, short-term borrowings by German banks in this market are subject to German minimum reserve requirements. However, owing to numerous exemptions, only about one quarter of the bank's external DM-liabilities are actually reservable[2]. Above all, funds may flow from the Euro-market to German banks without being subject to the minimum reserve if the agreed maturity is at least four years. Furthermore, capital imports through sales of bank bonds are minimum reservefree, even if the remaining maturity of these bonds is short. The possibility of such minimum reservefree borrowings in the Euro-DM market is the basis for German banks to borrow on a large scale in that market.

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1) A positive explanation of the fact that Euro-banks have been continuously in a net creditor position vis-à-vis German banks basically reflects the past experience of continued foreign investments in the Deutsche Mark, which gradually became the second important currency in international portfolio diversification. In particular, foreign investors favoured the Euro-DM market relatively to the domestic German market due to more attractive interest rates (no minimum reserve burden in the Euro-market) and because there were in Germany no suitable short-term investment possibilities except sight and time deposits subject to the minimum reserve requirement.

2) Deutsche Bundesbank (1983), p. 34.

2. Domestic Money Market and Monetary Aggregates in Germany: Basic concepts and Figures

. Domestic Money Market [1)]

The German money market is, in its narrow definition, an interbank market for central bank balances. In this definition, the market is, for example, the analogue to the 'Federal Funds Market' in the U.S.

Market participants are domestic banks only. Central bank balances are held by these domestic banks on giro (current) account at the Deutsche Bundesbank system; the balances do not earn interest.

Transactions between domestic banks in central bank balances are generally of a very short-term nature: maturities of funds lended or deposited range between 1 day and one year. In correspondance to the Euro-DM market, maturities up to 3 months dominate.

For a precise definition of central bank balances R and their relation to the concept of central bank money Z ("base money"), see table on page 9.

. Domestic Monetary Target

The monetary target of the Deutsche Bundesbank is central bank money stock MZ. It is composed of currency in circulation C and the reserve component $\overline{RR}_d$, i.e. the required minimum reserves on domestic liabilities at constant reserve ratios as of January 1974; hence

$$MZ = C + \overline{RR}_d.$$

(For details, see table on page 9).

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1) For a detailed description and analysis, see Gebauer (1981).

Central bank balances, central bank money, and central bank money stock target in Germany

Currency in circulation at non-banks (C)

plus

Total Required Reserves at current ratios (RR) plus Excess reserves (RE)

↓

Central bank money (Z)

Required Reserves on domestic liabilities at constant reserve ratios ($\overline{RR}_d$)

↓

Central bank money stock target (MZ)

Formally:

$Z = C + RR + RE$

$MZ = C + \overline{RR}_d$

$RR + RE =$ Central bank balances (R)

$RR = 0{,}09D + 0{,}06T + 0{,}04S + 0{,}08F$

(reserve ratios as of December 1982)

$\overline{RR}_d = 0{,}17D + 0{,}12T + 0{,}08S$

(reserve ratios as of January 1974)

D = Domestic Demand Deposits

T = Domestic Time Deposits } up to 4 years

S = Domestic Savings Deposits } of maturity

F = Foreign Deposits subject to minimum reserve requirements

Orders of magnitude (Dec. 1982)

C = DM 89 billion

RR = DM 50 billion

RE = DM 0,3 billion

Z = DM 138 billion

$\overline{RR}_d \simeq$ DM 85 billion

MZ $\simeq$ DM 174 billion

(seasonally adjusted)

. Implementation of Domestic Monetary Control[1)]

Monetary control is implemented on the domestic money market by means of the interest rates prevailing on this market. On the domestic money market, the Bundesbank controls, via its traditional interest rate and liquidity policy, the conditions, i.e. the interest rate cost, on which a single domestic bank can acquire central bank balances from another bank. The German banking system (i.e. all domestic banks together) needs additional central bank balances as a result of its prior monetary expansion: As banking business and, therefore, liabilities subject to minimum reserve regulations increase, there will be additional currency demand plus additional minimum reserve requirements: Both factors force banks to bid for additional central bank balances in order to refinance their expansion. Given this necessity, the Bundesbank can exert a restrictive influence on monetary expansion of the domestic banking system by raising its refinance costs (money market interest rates), and vice versa. For example, a sustained reduction in nominal money market interest rates tends to show up, after some months, and via a chain of interest rate relationships in various financial markets (interest rate structure), in an accelerating growth of central bank money stock. The recent acceleration of money stock growth in Germany is an example for this meachnism.

Why is there no room for a direct, quantitative control of money stock growth via manipulated changes in central bank balances? The answer is to be based on the knowledge of the institutional framework of monetary policy in Germany - in particular on the calculation and handling of the minimum reserve instrument.

a) Required reserves are calculated on the basis of bank liabilities on 23rd and last day of prior month, and on 7th and 15th day of current month. Hence, banks know their refinance needs, due to past expansionary activities, around mid-month, and there is no way for them to change lateron the amount of this required refinancing.

b) As the Bundesbank does not want to force banks into non-fulfilment of their minimum reserve requirements, she has to furnish, for the current month, the additional central bank balances necessary for the domestic banking system to fulfil the reserve requirements. Hence, in theory and practice, German banks do not need any prior excess liquidity

1) For a recent overview, see Dudler (1983).

(in the sense of excess reserves or any actual or potential central bank balances) to expand their activities, i.e. grant new loans and create new (monetary) liabilities. There is, therefore, no sense in using any credit or money multiplier analysis in the various forms given in the literature. Banks are able, to put the point succinctly, to grant loans without any prior excess liquidity.

c) In the longer term, however, the cost of (necessary) refinancing is dictated by the Bundesbank via some suitable combination of its interest rate and liquidity policies, applied to the domestic money market (see above).

. Relation to Money and Credit Figures in the Euro-DM Market

The bulk of Euro-DM deposits are interbank deposits between Eurobanks, funds from other banks and central banks. All these deposits do not count as money in the conventional definition: Among the DM-liabilities of Euro-banks to non-residents, only the deposits of non-banks should be considered as money comparable to a domestic money stock definition. The corresponding total of DM 28 billion Euro-DM deposits in mid-1982 was composed of DM 18 billion deposits held by foreign non-banks and DM 10 billion deposits held by German non-banks. These DM 10 billion are directly comparable with domestic demand deposits (up to 30 days) or time deposits (1 month to 4 years); they are, due to their short maturities, at least as "moneylike" as domestic time deposits[1].

As measured by domestic money stock M2 (currency, demand and time deposits held in Germany by German non-banks, totalling roughly DM 500 billion), the Euro-DM deposits of German non-banks are comparatively small at about 2 %. Owing to the rapid growth of the Euro-DM market, this share has been built up relatively soon, however. Therefore, there is some reason that shifts in time deposits between the domestic market and the Euro-market may increasingly undermine the informative

1) This is by now the official assessment of the German Central Bank, see Deutsche Bundesbank (1983), page 31.

value of domestic monetary aggregates. Between mid-1980 and mid-1981, for example, the domestic money stock M2 (i.e. excluding Euro-DM deposits) grew by 11 %, while the Euro-DM deposits of German non-banks nearly doubled. An extended monetary aggregate including such Euro-DM deposits, would have indicated a somewhat stronger monetary expansion[1].

In June 1982, outstanding DM-loans granted to German non-banks by Euro-banks amounted to DM 73 billion. Again, these borrowings in the Euro-DM market are not recorded in the traditional monetary statistics, which are confined to the domestic banking system. Therefore, credit expansion as measured in Germany can provide misleading information about actual credit demand. For example, traditional domestic monetary statistics showed, in the first half of 1982, a seasonally adjusted increase of bank loans to German enterprises and households of DM 30 billion or 5,6 % annual rate; including loans granted by Euro-banks, the figures are much higher, showing an increase of DM 38 billion or 6,0 %[2]. In terms of volume: short-term Euro-DM loans to German enterprises have meanwhile reached a share of 15 % of comparable short-term loans in the domestic market.

Taken together, the basic figures for money and credit reveal that the existence of Euro-DM deposits of German non-banks as well as Euro-DM loans to German non-banks clearly jeodardize the information content of strictly domestic money or credit aggregates. Moreover, as interest rates to be paid on Euro-DM loans are normally lower than on domestic loans, the faster growth of Euro-bank business relative to domestic bank business might continue.

What does this mean for the monetary control issue? There are two main areas to be investigated:

- The money and credit creating potential of the Euro-DM market and the mechanism of its possible interference with domestic monetary control in Germany; and

- The interest rate interrelationships between the German and the Euro-DM money markets, as interest rates are at the heart of German money stock control procedures.

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1) Deutsche Bundesbank (1983), p. 32.

2) Deutsche Bundesbank (1982), p. 14.

PART II - MONETARY EXPANSION IN THE EURO-DM MARKET: THE MULTIPLIER ISSUE AND THE INTEREST RATE LINKAGE

1. Reflections on the Euro-Currency Deposit Multiplier

The "Euro-currency deposit (or credit) multiplier" is a shorthand name to describe the alledged ability of Euro-banks "to expand autonomously the stock of money and credit outside the control of national authorities"[1]. There are two basic points of interest here:

- the monetary expansion potential of the Euro-banking system alone, resulting from the assumption that some constant proportion of lended funds is redeposited in the system; and

- the monetary expansion potential of the combined Euro- and national banking systems, in view of the close interrelationships between domestic and Euro-markets.

Both issues are to be discussed, in the present narrow context, in terms of a Euro-DM multiplier concept. Before that, some general points of clarifications should be advanced:

. The focus will be on the direct contribution (or interaction) of monetary expansion in the Euro-DM market to (with) domestic monetary developments; no indirect contributions or interrelationship will be discussed[2].

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1) Johnston (1981), p. 5.

2) For example, the Euro-DM market has increased the mobility of international capital movements as well as the substitutability of DM-assets in other currencies. This, in turn, might have contributed to higher exchange rate variability, thus provoking increased exchange market interventions by the German central bank. Those interventions, however, may pose a potential threat to a successful control of domestic monetary targets. - On these matters, see for example Gleske (1982) and Folkerts-Landau (1982).

. There are at least two conflicting theoretical approaches to the Euro-currency multiplier issue: The Friedman-type view of a fixed coefficient ex post multiplier[1], and Tobin's "new view" embodied in portfolio equilibrium models of the monetary expansion process[2]. Both approaches, the early fixed coefficient models of multistage banking system expansion as well as their later extension to general equilibrium portfolio models, have been criticized on theoretical terms as an inadequate framework for monetary analysis of international financial markets[3]. This discussion is not taken up here.

. Instead of abstract theoretical arguments, the following reflections are mainly based on explicit institutional considerations[4].

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1) See Friedman (1969) and Carli (1971), Mayer (1971), Willms (1976) for an early application of this "old view", which may be traced back to Phillips (1920).

2) See Tobin (1963) and Swoboda (1980) or Johnston (1981) for recent applications of the "new view".

3) For a recent critique, see for example Mayer (1979), Folkerts-Landau (1982) and de Cecco (1982).

4) In the tradition of the classic paper by Lutz (1974).

1.1 The Monetary Expansion Potential of the Euro-DM Market

The "endogenous" Euro-multiplier issue concerns, as mentioned, the ability of Euro-banks to expand irrespective of existing interrelationships with "outside" markets or banks. The crucial assumption in our case would require, therefore, that the Euro-DM market should not be considered as a part of the German money market, but as a separate banking system of its own. It has been demonstrated above that this assumption is untenable. As the Euro-DM market is not a closed banking system, the very idea (or concept) of an endogenous Euro-DM multiplier simply does not apply. It could be argued, therefore, that any further and closer look at that multiplier idea does not make sense.

Nevertheless, in order to state the case against the usefulness of endogenous Euro-DM multiplier analysis as strongly as possible, a short explicit presentation of the multiplier idea should be given, followed by a short critical discussion. It suffices to take the most simple Friedman-type multiplier concept, as the basic objective to be raised in terms of multiplier stability apply to the Tobin-type approach as well.

The national endogenous multiplier analysis (assuming a closed domestic banking system) starts out with a given flow of central bank balances to bank A. It is then shown how additional deposits are created successively: The supplier (manufacturer) of the borrower of bank A takes up (redeems) the received cheque to a small part in cash; to a larger part, he deposits the proceeds of the cheque in his giro account at bank B. This bank B in turn extends a loan on the basis of the received additional funds (demand deposits); this gives rise, on the part of the supplier (manufacturer) of the borrower of bank B, to a new demand deposit at bank C, and so on with diminishing absolute amounts. The overall total of the demand deposits created during this process depends, ceteris paribus, on the banking system's reserve ratio r and on the cash/deposit ratio d, such that

$$D = D^*/(r + d), \qquad (1)$$

with D denoting total new deposits inclusive of the original (initial) deposits D^* [1].

1) All this is standard textbook approach. For a classic (and critical) outline of the "old view" see Tobin (1963), pp. 408.

The (Friedman-type) Eurocurrency multiplier concept is constructed in simple analogy to the national multiplier concept. The domestic cash leakage denoted by d corresponds to the outflow of funds from the Euro-DM market, either by currency conversion or by transaction to the domestic (money) market. If we denote these Euro-market leakages by d_E, and take into account the absence of reserve requirements ($r_E = 0$), the Euro-DM market multiplier is correspondingly

$$D_E = D_E^*/d_E \qquad (2)$$

with D_E denoting total new (demand) deposits in the Euro-market, which again include the original deposits D_E^*.

In order to be of any analytical use, these multiplier concepts should, as a minimum requirement, be empirically stable, roughly constant and foreseeable magnitudes. The domestic multiplier meets these criteria insofar as the reserve ratio r is given (unless it is discretionarily changed by the central bank), and the currency leakage d (the ratio of total currency in circulation to total demand[1)] deposits) changes only slowly and gradually over time.

The endogenous Euro-DM (and, in general, any Euro-currency) multiplier concept does not, however, fulfil these requirements, as there are rather variable leakages (denoted by the summary measure d_E):

- experience of the last 10 years shows that DM-funds are converted into other currencies, e.g. due to interest rate differentials or exchange rate expectations, in large and, at times, drastically variable amounts;

- DM-funds are flowing into the domestic German market in variable amounts (see above: Euro-market as extension of domestic money market).

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1) The range of deposits to be included depends on the underlying definition of money and on the elasticity of substitution between various forms of deposit components of the money stock. Constraining the analysis to demand deposits only is, of course, a strong simplification.

As a consequence, a causal connection between successive deposits may be postulated for a closed domestic banking system, but not for the Euro-market. This is another way of saying that an Euro-DM multiplier would be unstable and, therefore, would be analytically useless.

Finally, the Euro-DM multiplier concept (2) would ignore the existence of institutional constraints, which may interfere with a postulated "clean" multiplier mechanism. The local banking supervising authority of the main Euro-DM market center Luxembourg, (Commissariat au Contrôle des Banques"), insists for example on balance sheet principles like a minimum capital coefficient [1]. On this provision, business expansion might be constrained by an insufficient ratio to the Euro-banks' own capital. In particular, as the interest rate margins in the lending business are rather narrow (roughly 1/2 % point), the Euro-bank's capital is bound to grow, via accumulation of interest rate profits, rather slowly in relation to its overall balance sheet expansion.

There seems to be only one case for a special application of an Euro-DM multiplier concept: It has been observed, at some instances in the past, that a customer gets a loan from an Euro-bank and deposits the proceeds fully with that very same bank. Clearly, there are no technical limits in repeating this; one might talk of an infinitely large multiplier or an infinitely elastic credit supply of a single bank in that special case. And there have been, at times, comparable activities of foreign central banks who increased in this way their gross currency reserves and their international liquidity position. But, to repeat: These are special cases, and they apply to selected single banks only.

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1) For details, see Storck (1980), p. 450-452.

1.2 A Multiplier Concept for the Combined Domestic and Euro-DM Banking System?

The idea of using multiplier analysis for the combined domestic and Euro-market expansion possibilities is directly related to the monetary control issue: The relationship between some quantitative domestic control variables like "base money" or bank reserves and the domestic money stock growth might be weakened, or even destroyed, by the existence of Euro-currency markets[1)]. In the present study, it will be left open if multiplier analysis should be considered as an analytically useful tool on such a general level. Focusing on the DM segment of Eurocurrency markets, however, we have to acknowledge that the domestic monetary control variable is not a bank reserves or monetary base magnitude, but the nominal money market interest rate (see above). This draws, by any means, attention away from possible quantitative interrelationships between domestic bank liquidity and Euro-DM deposit creation, if the control aspect is to be analyzed. Therefore, the following sections concentrate on "the interest rate-side" of the control issue.

It should, of course, be kept in mind that any "extended" money market analysis for the combined domestic and Euro-DM segments is a promising subject to pursue in its own right, with a view, for example, of the above mentioned indicator function of strictly domestic monetary aggregates or on actual payments transactions. For example, Euro-DM deposits (just like domestic time deposits) cannot be used directly for payment purposes (no cheques can be drawn, as a rule, on deposits with Euro-banks). They must be converted into DM demand deposits in Germany before they can be used for payment. Those issues seem to be, however, largely unconnected with any multiplier reasoning.

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1) See, for example, recent analysis of the control issue by Mayer (1981), Johnston (1981) and Frydl (1982).

2. The Interest Rate Linkage between the Domestic and the Euro-DM market[1)]

As regards the banks participating in both (interrelated) money markets, there are practically no differences of standing or of types of deposits. In general, DM assets in the domestic market are close substitutes to DM assets in the Euro-DM market, and vice versa. In addition, there are no restrictions on the free flow of financial capital between both markets. Therefore, it should not come as a surprise that nominal interest rates in both markets are closely connected. The linkage is established by arbitrage transactions between domestic and Euro-banks. (There are, of course, arbitrage transactions by other markets participants, too). "Arbitrage" is here broadly defined as any financial transaction in Deutsche Mark between the domestic money market and the Euro-market which is undertaken in response to a widening in the Euro-DM/domestic interest rate differential and which tends to narrow the differential[2)]. As all transactions are conducted in Deutsche Mark, arbitrage can be analyzed, in the present context, without explicit attention to forward cover and to traditional interest rate parity considerations: Market participants do not face the necessity to change currencies in the course of arbitrage transactions.

2.1 Domestic and Euro-DM money market rates in the "arbitrage tunnel"

Empirical observation demonstrates that the Euro-DM rate moves, as a rule, within a rather narrow "arbitrage tunnel". Its upper ceiling is set by the domestic money market rate; the tunnel floor is set by this very same rate less minimum reserve costs on foreign liabilities.

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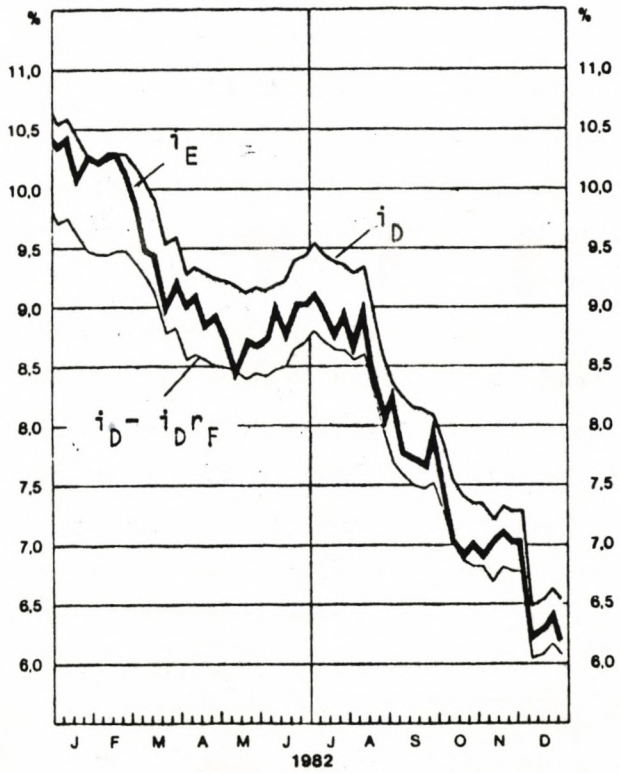
1) For a concise treatment which is based on a more general, theoretical analysis of Euro-currency interest rate determination, see Johnston (1979) or the by now "classic" book by Einzig (1970). A recent empirical assessment is contained in Deutsche Bundesbank (1983), p. 33/34.

2) On this definition, see Kreicher (1982).

Arbitrage tunnel of
Euro-DM interest rate*)



*) Weekly figures (Wednesdays) in % p.a. (Source: Deutsche Bundesbank)

i_E Euro-DM interbank rate on three month deposits

i_D Money market interbank rate in Frankfurt on three month deposits

r_F Current German minimum reserve ratio on foreign time deposits
(r_F = 0,0795 Jan. - Sept. 1982; r_F = 0,0715 Oct. - Dec. 1982).

$i_D r_F$ Minimum reserve cost. The tunnel floor is given by

$$i_D = \frac{i_E}{1 - r_F} \quad ; \text{ that is, } i_E = i_D (1 - r_F), \text{ or}$$

$$\boxed{i_E = i_D - i_D r_F.}$$

The chart shows, on the basis of weekly observations, the arbitrage tunnel and movements of the Euro-DM interest rate within that tunnel in 1982[1]. It is evident that the Euro-DM rate closely follows the domestic money market rate (the tunnel ceiling). Major deviations are only possible if there are, in addition to the regular minimum reserve, further administrative obstacles to arbitrage transactions or particularly strong short-run interest rate expectations. Obviously, then, controlling the domestic money market rate means effective control of Euro-DM rates, too. What is the explanation for this in detail - how does arbitrage work in this case?

- If the Euro-DM rate i_E would exceed the domestic money market rate i_D, German banks could obtain an easy profit simply by borrowing in the domestic money market and lending the proceeds in the Euro-DM interbank market. Therefore, a situation

$$i_E > i_D$$

cannot persist. Such arbitrage transactions would quickly[2] reduce the Euro-DM rate, at least to the level of the domestic money market rate.

- If the Euro-DM rate i_E would underpass the tunnel floor, it would differ from the domestic money market rate i_D by more than minimum reserve cost on foreign liabilities, $i_D r_F$. In such a situation, the effective cost of borrowing in the Euro-DM market would be, for German banks, lower than the cost of raising funds in the domestic money market. Therefore, if we have

$$i_E < i_D - i_D r_F$$

there is again a possibility to arbitrage: German banks will borrow funds in the Euro-DM market and lend the proceeds in the domestic market at a profit. Consequently, the interest rate spread will narrow, at least to the point where there is equality between the Euro-rate and the effective domestic borrowing cost (the tunnel floor).

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1) The chart is taken from Deutsche Bundesbank (1983), p. 33.

2) "Quickly" normally means within minutes rather than days or weeks: Today, large international banks should be considered as financial information corporations, which handle very efficient telecommunication and computer systems, implementing nearly instantaneous price adjustments of financial assets.

Four qualifications should be added to the explanation just given.

First, it will be mainly the Euro-market rate which reacts to arbitrage transactions: The domestic money market is the "broader" one, and, more important, the domestic money market rate is controlled by the Bundesbank's interest rate and liquidity policy, i.e. it is "exogenous" to the Euro-rate.

Second, transaction cost have been neglected so far. This appears to be justified, as such costs are generally rather low in international financial markets relative to the transaction volumes. In the specific case of transactions between a domestic German bank and its, say, Luxembourg subsidiary, these costs are virtually nil.

Third, the argument has been, of course, partial. No account has been taken of the interrelationship between domestic money market rates in DM and comparable rates for, say, federal funds in U.S. dollars. This differential has acted, at times at least, as an effective constraint on German interest rate policy (due to exchange rate and balance of payments considerations of the German authorities). Therefore, it is the $/DM relationship (in interest rates as well as exchange rates) which might effectively limit the Bundesbank's autonomy to control domestic monetary expansion via interest rate changes.

Fourth, such broader external factors like the DM/$ exchange rate movements (or tendencies of the Euro-$ interest rate) are relevant for the position and movements of the Euro-DM interest rate <u>within</u> the "tunnel". The Euro-DM rate i_E will tend to rise, for example,

- when the DM/$ exchange rate is weak (foreigners moving out of DM and into $ assets, thus reducing the supply of DM);
- when the Euro-$ interest rate increases;
- when there are expectations for interest rate increases in Germany (i_E is more flexible than i_D).

3. Concluding Remarks

Pulling the arguments advanced so far together, the following results emerge (on the basis of partial analysis, i.e. excluding interrelationships with the Euro-dollar market or U.S. financial markets).

(1) The Bundesbank's control of interest rates at the domestic money market is effectively extended, via arbitrage transactions, on the Euro-DM market as well.

(2) Interest rate control is the means by which the Bundesbank effectively controls the expansion of money and credit aggregates in Germany. As a rule, there is a reliable inverse raltionship between domestic interest rates and monetary expansion.

(3) As interest rate control is extended to the Euro-DM market as well, there is no basic conflict between the Euro-market's money and credit creating potential and the Bundesbank's autonomy in terms of monetary control. The alledged dangers for domestic monetary control, derived statistically (from huge gross figures of Euro-market volume) and theoretically (from the notion of an endogenous Euro-market multiplier) seen to be exaggerated.

(4) However, as the money and credit creating potential of the Euro-DM market is a limited, but given fact, there is some impact on domestic monetary control in Germany. Tentatively, it may be argued that the existence of the Euro-DM market requires stronger domestic interest rate changes to achieve a monetary expansion target, and that the time lags involved may be longer and/or more variable. This is a guess; there is so far no empirical evidence available on this point. Some factors like high capital mobility (due to the existence of Euro-currency markets) provide, however, some indirect evidence, which has given rise, for example, to far reaching proposals for international monetary reform.[1)]

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1) See, for example, the tax proposal by Tobin (1980).

(5) The money and credit creating potential of the Euro-DM market seems, however, to distort increasingly the information content of conventional monetary expansion statistics, which are based on domestic figures only. Therefore, there is a danger that the indicator function of the German monetary target (central bank money stock) and of other domestic monetary and credit aggregates deteriorates. There is, therefore, a need to reassess - and possibly redefine - the concept and meaning of such aggregates.

(6) In conclusion, points (4) and (5) do not justify a negative attitude towards the existence and working of the Euro-DM market. In particular, there seems to be no basic conflict between the existence of this market and the Bundesbank's autonomy to control domestic monetary expansion. Therefore, considerations to control Euro-markets by administrative regulations do not appear to be particularly urgent from this point of view.

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